UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,482	03/30/2001	Erik Cota-Robles	042392.P9774	5734

8791	7590	10/18/2005

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER
ALI, SYED J

ART UNIT	PAPER NUMBER
2195	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

		Application No.	Applicant(s)
Office Action Summary		09/823,482	COTA-ROBLES ET AL.
		Examiner	Art Unit	
		Syed J. Ali	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2005*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8,10,11,13-26,28-31,33-40,42 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8,10,11,13-26,28-31,33-40,42 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection.   Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114.   Applicant's submission filed on August 26, 2005 has been entered.   Claims 1, 3-

8, 10-11, 13-26, 28-31, 33-40, 42, and 44 are presented for examination.

2.   The text of those sections of Title 35, U.S. code not included in this office action can be

found in a prior office action.

Claim Rejections - 35 USC § 102

3.   **Claims 1, 3-8, 10-11, 13, 16, 19, 23-26, 28, 31, 33-34, 36, 40, 42, and 44 are rejected**

under 35 U.S.C. 102(e) as being anticipated by Bugnion et al. (USPN 6,496,847)

(hereinafter Bugnion).

4.   As per claims 1, 8, 11, 26, 31, 40, 42, and 44 Bugnion teaches the invention as claimed,

including a hardware platform including a hardware component of a soft device (col. 7 lines 12-

25);

        constructing a soft device, comprising implementing a driver of the soft device in a

virtual machine monitor (col. 4 lines 52-61); and

making the soft device available for use by one or more virtual machines coupled to the virtual machine monitor (col. 7 lines 12-25).

5.   As per claims 3, 10, 13, 16, 19, 28, 33-34, and 36, Bugnion teaches the invention as claimed, including exporting an emulation of a fixed function hardware device to said any of the one or more virtual machines (col. 7 lines 12-25);

by presenting the first virtual machine to the second virtual machine as an external, internal, or hardware device (col. 8 lines 5-19); and

emulating communication between the first virtual machine and the second virtual machine (col. 15 line 58 - col. 16 line 3).

6.   As per claim 4, Bugnion teaches the invention as claimed, including performing computations requested by said any of the one or more virtual machines without notifying a residual fixed function device (col. 8 lines 33-52).

7.   As per claim 5, Bugnion teaches the invention as claimed, including transferring an operation requested by said any of the one or more virtual machines to a residual fixed function device (col. 8 lines 33-46); and

the residual fixed function device performing the operation requested by said any of the one or more virtual machines (col. 8 lines 5-19).

8.   As per claim 6, Bugnion teaches the invention as claimed, including performing a portion of computations requested by said any of the one or more virtual machines to a residual fixed function device (col. 8 lines 5-19; col. 8 lines 33-52); and

performing a set of operations on hardware registers of a residual fixed function device to complete a task requested by said any of the one or more virtual machines (col. 9 lines 41-51).

9.   As per claim 7, Bugnion teaches the invention as claimed, including manipulating data stored in memory to effect zero or more transformations (col. 7 lines 32-45); and

transferring data to or from a residual hardware device using a direct memory access (DMA) technique (col. 7 lines 32-45; col. 12 lines 6-19).

10.   As per claim 23, Bugnion teaches the invention as claimed, including configuring the first virtual machine to match the hardware device (col. 7 lines 12-25).

11.   As per claim 24, Bugnion teaches the invention as claimed, including the software component of the soft device comprises at least a portion of software of a fixed function device (col. 8 line 66 - col. 9 line 19).

12.   As per claim 25, Bugnion teaches the invention as claimed, including varying the portion of software that is used as the software component depending on how closely the first virtual machine matches the hardware device (col. 8 line 66 - col. 9 line 19).

Claim Rejections - 35 USC § 103

13.   **Claims 14-15, 17-18, 20-22, 29-30, 35, and 37-39 are rejected under 35 U.S.C. 103(a)**

as being unpatentable over Bugnion in view of Lim et al. (USPN 6,795,966) (hereinafter

Lim).

14.   As per claim 14-15, 17-18 20-22, 29-30, 35, and 37-39, Lim teaches the invention as

claimed, including emulating communication by providing a virtualized device (col. 7 lines 38-

45; col. 14 lines 28-33) that provides a communication link between the first and second virtual

machines by linking the virtualized device to the soft device and trapping and reflecting access to

the virtualized devices (col. 7 lines 45-54; col. 14 lines 33-43), wherein the virtualized device is

any one of a PCI card, an external USB device, an internal USB device, a network interface card,

and any other standard personal computer device (col. 16 lines 16-34).

15.   It would have been obvious to one of ordinary skill in the art to combine Bugnion and

Lim as the method disclosed by Bugnion provides all the necessary tools to virtualize an entire

computer system, but does not specifically mention how communication is handled between

virtual machines that are acting as peripheral devices. There is a great deal of overlap in the

disclosures of Bugnion and Lim, but Lim is cited to show that a virtual machine can be used to

emulate any type of peripheral device and appear to the host operating system as though it were

the original device. All communications that are normally routed through the peripheral device

go through the virtual machine, and the virtual machine transparently communicates with the

physical resources. As any component can be virtualized, the typical manner in which a device

operates is inherently implemented within the virtual machine.

Response to Arguments

16.   **Applicant's arguments filed August 26, 2005 have been fully considered but they are not persuasive.**

17.   Applicant argues, *"Bugnion does not teach or suggest the use of soft devices. The devices disclosed in Bugnion are physical system devices."* In support of this argument, Applicant adds that the claimed soft devices *"may be a hardware device that includes a host software component and a reduced functionality hardware component."* Therefore, Applicant concludes that Bugnion fails to teach the use of soft devices.

18.   The example of a soft device presented by Applicant is merely one example of a soft device. It should be noted that Applicant has pointed to the description of a "host-based" soft device, while the claim merely recites a "soft device". Thus, Applicant is arguing limitations that are not in the claims and construing claim terms more narrowly than is actually reflected in the claim language. It is settled law that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181 (Fed. Cir. 1993). "Soft devices", as they are known in the art, are simply software modules or processes that perform the functions of a hardware device (US 6,934,269 to Hasha et al. at col. 3 lines 8-27, "a device may be a 'soft' device or service within a more complex component. For example, a device may be a software process implemented in a computer system."); (US 6,629,178 to Smith at col. 1 lines 39-52, "Another category of high-

priority bus agents are soft devices, in which a system processor accomplishes with software many functions that would be otherwise accomplished with hardware in the device.")

Given this definition of a soft device, it is easy to see that Bugnion does in fact teach the use of soft devices by providing software emulation of hardware devices, such that the emulation can be ported across platforms and used in different environments (col. 1 lines 54-59; col. 4 lines 52-61). Bugnion teaches a way of providing such virtualization for an entire computer system, wherein the virtualized devices are embodied in a virtual machine monitor, such that multiple virtual machines may all simultaneously interface with the virtual machine monitor. That the actual physical device is not necessary for proper implementation of Bugnion is actually made clearer in Lim, wherein Bugnion is the parent application of Lim. Lim indicates that in Bugnion, "it is not necessary for an emulation module to have an actual physical counterpart in the system." (col. 17 lines 4-5). The device may be implemented purely as a software module, such that it can be extensively tested without requiring the use of the actual device (col. 17 lines 4-17). Thus, Bugnion clearly meets the claim limitations and does teach the use of "soft devices". Whether Bugnion teaches "host-based" soft devices is of no consequence, as the limitation is not claimed.

Conclusion

19.   All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action

after the filing of a request for continued examination and the submission under 37 CFR 1.114.

See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR

1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

will the statutory period for reply expire later than SIX MONTHS from the mailing date of this

final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Syed J. Ali whose telephone number is (571) 272-3769. The

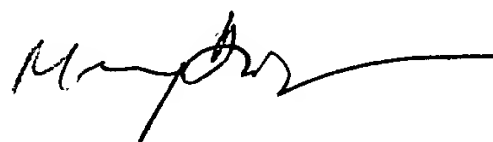examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai T. An can be reached on (571) 272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Syed Ali
October 7, 2005

MENG-AI T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100